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MARKETING RESEARCH REPORT NO. 819

MARKETING AIDS FOR THE CATTLE FEEDER

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PREFACE

Cattle feeders in the United States buy and sell in a nationwide market. Thus, information concerning placements of feeder cattle, marketings from feedlots, and average weights is of value in making their own placement and marketing decisions. Estimates of future placements and subsequent marketings throughout the Nation are also of value when used in proper perspective with recent market reports and knowledge of special conditions such as adverse weather.

A single set of predictor formulas for cattle feeders to determine probable nationwide placements, marketings, and average market weights is presented in this report. These formulas were developed primarily for use by feedlot operators, farm managers, and extension workers. Ways of using the estimators for maximum benefit are discussed here in nontechnical terms. Statistical terminology is in the appendix. Formula reliability is shown by comparing the quarterly formula predictions for 1955-66 with the actual figures.

CONTENTS

	Page
Introduction	1
Placements of Cattle on Feed	2
Marketings of Fed Cattle	5
Average Weight of Fed Cattle Marketed	6
Method for Estimating Future Periods	8
An Example--1-Year Estimate	10
Appendix	13

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MARKETING AIDS FOR THE CATTLE FEEDER

by

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INTRODUCTION

The right marketing decision will increase profits on any lot of cattle. A poor decision may turn a profitable feeding plan into a loss. As cattle feeding and the size of lots fed have increased, market decisions, as opposed to production decisions, have increased in importance.

Primary market decisions are when to place cattle on feed, how many to place on feed, and what weight and sex of cattle to place on feed. These decisions, combined with the feeding program, to a large extent determine the time and average weight of subsequent feedlot marketings. Depending on current conditions, feeders have some latitude in the time and weight of marketing fed cattle, but this flexibility is limited to a rather short time.

The current beef and cattle market is essentially nationwide in scope with regional price differences generally reflecting varied transportation costs. Therefore, given consumer demand, almost any cattle feeder is affected by the national supply situation. Reports of placements and marketings of fed cattle are the indicators of the national supply.

The cattle feeder needs to know the supply of cattle available for feeding, the probable number of these cattle that will be fed, feed supplies, and probable total marketings at the time the cattle will reach market weight. With this information, the feeder can choose the number and weight of cattle to place on feed and ready these cattle for market at the time and weight that appear most profitable.

Considerable information is available to the cattle feeder. Daily reports of prices and local supply situations are carried by radio, television, and local newspapers. Weekly summaries of market news are available 1/ as are quarterly and, more recently, monthly reports of cattle placed on feed and marketed from feedlots. 2/ Data indicating feed supplies and prospective feed

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1/ Livestock Meat and Wool, Weekly Summary and Statistics. Livestock Div., Consum. & Mktg. Serv., U.S. Dept. Agr.

2/ Cattle on Feed, annual report of 39 States, quarterly report of 32 States, and monthly report of six States. Statis. Rptg. Serv., U.S. Dept. Agr.

production are also given wide distribution from planting time to harvest. 3/ The annual livestock inventory issued each February indicates the number of potential feedlot replacement cattle available.

Intended marketings during the forthcoming quarter are published in Cattle on Feed reports. But indications of prospective placements of cattle on feed or marketings in future periods are not readily available. This report presents a set of simple estimators of nationwide placements of feeder cattle, marketings of fed cattle, and average slaughter weights for each quarter of the calendar year. Cattle feeders may use these as an indicator of changes in potential supplies of fed cattle along with other available information when making placement and marketing decisions.

These estimators are developed from available data for each quarter during 1955-66. They portray the average changes in placements, marketings, and weights in response to forces generally present throughout the period. The effects of unusual forces occurring in isolated instances cannot be included. These special conditions might be drought, unusually good range and pasture conditions, widespread sustained bad weather during marketing periods, large supplies of wet corn, or numerous other factors. However, as the tests of the estimators indicate, one or two factors are primary indicators of placements, marketings, and average weights. Using this set of simple estimators and other available information, the potential fed cattle supply situation can be estimated up to a year in advance with a given probability of being right.

The material presented here was developed for use primarily by feedlot operators, farm managers, and extension workers. Statistical tests of reliability and data used in developing the estimators are presented in the appendix.

PLACEMENTS OF CATTLE ON FEED

Feedlot placements over the Nation depend primarily on the supply of cattle available for feeding and an indication of the relative profitability of cattle feeding during each calendar quarter.

The beef-corn ratio is the best indicator of the relative profitability of cattle feeding in all but the April-June quarter, when the fed beef price alone proved to be a better indicator of placements of fed cattle when used with the potential supply indicator. During 1955-66, these two factors explained 97-98 percent of the variation in national feedlot placements.

Placements of cattle on feed in the first quarter, January-March, are estimated using the current (January-March) beef-corn ratio and the January 1 number of beef cows reported 1 year earlier. 4/ The beef-cow inventory 1 year

3/ Grain Stocks in All Positions, issued four times a year, and Crop Production, issued monthly. Statis. Rptg. Serv., U.S. Dept. Agr.

4/ Nationwide placements and marketings of cattle on feed are considered for the 39 States discussed in Cattle on Feed, Statis. Rptg. Serv., U.S. Dept. Agr. See footnotes of tables 1 and 3 for further data definitions.

earlier is the source of the previous year's calf crop which supplies many of the cattle placed on feed during the first quarter. The beef-corn ratio is based on the ratio of Choice steer prices at 20 major markets to the price of No. 3 corn at Chicago. Since prices at major markets are highly correlated, the price of Choice steers at other leading markets may be substituted for the 20-market average with little loss in precision. The estimator of first quarter placements in thousands of head is as follows:

$$0.243 \times \left\{\begin{array}{c}\text{Jan. 1 inv.}\\ \text{of beef cows}\\ \text{the previous yr.}\\ \text{(1,000 hd.)}\end{array}\right\} + 103.85 \times \left\{\begin{array}{c}\text{Beef-corn}\\ \text{ratio}\\ \text{1st qtr.}\end{array}\right\} - 5{,}798$$

The constant term (-5,798) has no economic significance. It serves to position the relationship of the variables used within their relevant range. In subsequent relationships, the constant may have a positive as well as a negative value. The response coefficients (0.243 and 103.85) indicate the change in placements for a 1-unit change in the beef-cow inventory or the beef-corn ratio. For each change of 1,000 head in the beef-cow inventory a year earlier, placements change 243 head. Placements change approximately 104,000 head for each unit change in the beef-corn ratio.

The ability of this estimator to predict first-quarter placements during 1955-66 is shown in the January-March section of table 1. Actual placements, predicted placements, and predicted minus actual values are shown. The average error in the estimates during the period was 117,000 head while the average placements of cattle on feed during this period were 2,994,000 head.

The indicator of the supply of cattle available for feeding in the second quarter is the number of beef (other) calves in the current January 1 inventory. 5/ During the second quarter, the average Choice steer price was a better indicator than the beef-corn ratio. The estimator of placements in 1,000 head for the April-June period is as follows:

$$0.2055 \times \left\{\begin{array}{c}\text{Jan. 1 inv.}\\ \text{of beef (other)}\\ \text{calves, current yr.}\\ \text{(1,000 hd.)}\end{array}\right\} + 53.56 \times \left\{\begin{array}{c}\text{Ave. price of}\\ \text{Choice steers,}\\ \text{20 markets}\\ \text{2nd qtr.}\end{array}\right\} - 3{,}184$$

The ability of this estimator to predict over the historical period is also shown in table 1. The average error was 108,000 head.

The January 1 number of beef (other) calves indicates the potential supply of feeders in the third quarter. The current January 1 inventory of beef cows indicates the current calf crop and the potential supply of fourth quarter placements. The beef-corn ratio existing in these quarters indicates feeding

5/ "Other" calves as reported in the January 1 livestock inventory (commonly referred to as beef calves) includes all beef calves less than 1 year of age on January 1 plus all male dairy calves less than 1 year of age.

Table 1.--Actual and estimated values of cattle placed on feed in 39 States by Quarter 1955-66

(1,000 head)

Year	Jan.-Mar. quarter			Apr.-June quarter		
	Predicted by estimator	Actual 1/	Predicted minus actual	Predicted by estimator	Actual 1/	Predicted minus actual
1955	2,041	2,010	31	1,914	1,729	185
1956	2,030	2,003	27	1,782	1,911	-129
1957	2,033	2,028	5	1,823	1,931	-108
1958	2,632	2,594	38	2,097	2,150	-53
1959	2,515	2,662	-147	2,349	2,455	-106
1960	2,722	2,916	-194	2,453	2,273	180
1961	3,036	2,974	62	2,362	2,380	-18
1962	3,319	3,124	195	2,788	2,618	170
1963	3,325	3,103	222	2,922	3,010	-88
1964	3,512	3,765	-253	3,126	3,015	111
1965	4,044	3,922	122	3,566	3,619	-53
1966	4,715	4,823	-108	3,740	3,831	-91
	July-Sept. quarter			Oct.-Dec. quarter		
1955	2,521	2,565	-44	4,752	4,600	152
1956	2,771	2,965	-194	4,618	4,678	-60
1957	2,410	2,298	112	4,945	4,794	151
1958	2,507	2,402	105	5,231	5,382	-151
1959	3,024	2,970	54	5,550	5,466	84
1960	3,200	2,975	225	6,055	5,935	120
1961	3,300	3,487	-187	6,033	6,160	-127
1962	3,978	3,933	45	6,847	6,940	-93
1963	4,007	4,155	-148	6,430	6,683	-253
1964	4,348	4,554	-206	7,034	7,118	-84
1965	4,707	4,569	138	7,755	7,429	326
1966	4,923	4,823	100	7,752	7,817	-65

1/ Data from May 1967 and October 1965 issues of the Livestock and Meat Situation.

profitability. The estimator for the July-September quarter is as follows:

$$0.2765 \times \left\{ \begin{array}{c} \text{Jan. 1 inv.} \\ \text{of beef (other)} \\ \text{calves, current yr.} \\ \text{(1,000 hd.)} \end{array} \right\} + 83.42 \times \left\{ \begin{array}{c} \text{Beef-corn} \\ \text{ratio} \\ \text{3rd qtr.} \end{array} \right\} - 4,214$$

The estimator of placements in the October-December period is as follows:

$$0.2760 \times \left\{ \begin{array}{c} \text{Jan. 1 inv.} \\ \text{beef cows} \\ \text{current yr.} \\ \text{(1,000 hd.)} \end{array} \right\} + 151.19 \times \left\{ \begin{array}{c} \text{Beef-corn} \\ \text{ratio} \\ \text{4th qtr.} \end{array} \right\} - 4,964$$

The predictive ability of these two estimators is shown in table 1. Average errors were 131,000 and 139,000 head, respectively.

MARKETINGS OF FED CATTLE

Marketings equal placements plus or minus inventory change, minus death loss. Marketings during a quarter may be estimated with reasonable accuracy from placements in previous quarters with some further refinement based on price relationships at the time marketing was originally intended. For example, in late 1963, substantial numbers of fed cattle were held over to early 1964 in hope of an improvement in cattle prices.

In the set of marketings estimators to be presented, different combinations of placements in previous quarters are used to indicate probable marketings. This is due to the variation in fed cattle marketed in a particular quarter which stems from similar variations in placements in certain previous quarters. For example, marketings of fed cattle during the third quarter probably include some cattle placed on feed the preceding quarter, more of those on feed 180 days, and substantial numbers of calves on feed 270 days or a year. However, using data for 1955-66, variation in marketings of fed cattle during the third quarter stemmed from variation in placements of cattle on feed in only the first and second quarter. Apparently, the number of cattle fed 270 and 360 days that were marketed during the third quarter was rather stable; thus, their effect was included in the constant or the positioner value.

First-quarter marketings are a result of placements in the first, second, and third quarters of the previous year. In addition, the first quarter is the only quarter in which consideration of the beef-corn ratio in the fourth quarter of the preceding year improves the estimate. Estimators of marketings in the second and third quarters rely on the sum of placements in the three preceding quarters. Estimators of fed cattle marketings in each of the four quarters are shown in table 2. During the 12 years, 1955-66, fed cattle marketings averaged 3,773,000 head in the first quarter, 3,836,000 head in the second quarter, 3,543,000 head in the third quarter, and 3,480,000 head in the fourth quarter. The average errors of estimation for each quarter over this period were 38,000, 122,000, 77,000, and 65,000 head, respectively. The results of using the estimators in table 2 for 1955-66 are shown in table 3.

Table 2.--Estimators of fed cattle marketings

(1,000 head)

Quarter	Sum of placements in following quarters		Beef-corn ratio	Constant
Jan.-Mar.	0.3826 x 1st, 2nd 3rd quarters, previous yr.	- 14.38 x	4th quarter, previous yr.	+ 776.
Apr.-June	0.2811 x 3rd, 4th quarters, previous yr. 1st quarter, current yr.		1/	+ 417.
Jul.-Sept.	0.5960 x 1st, 2nd quarters, current yr.		1/	+ 390.
Oct.-Dec.	0.3606 x 1st, 2nd 3rd quarters, current yr.		1/	+ 364.

1/ Do not use beef-corn ratio for this estimator.

Marketings of fed cattle may be estimated one quarter in advance using reported placements and beef-corn ratio. Although the estimators explained 96 to 99 percent of the variation in 1955-66 marketings, other economic information must also be considered in planning feedlot strategies.

AVERAGE WEIGHT OF FED CATTLE MARKETED 6/

A change in the average weight of fed cattle marketed may have a greater effect on the total supply of fed beef than a change in the number of fed cattle marketed. Advance estimates of marketing weights are of value in adjusting feeding programs to speed up or retard marketings of cattle already on feed. Although useful, they are not as vital for long-term planning as are estimates of placements and marketings. The quarterly estimators of average weights consider the adjustment in the average weight of the previous quarter and the beef-corn ratio for one or two quarters earlier. The appropriate lag in beef-corn ratio reflects adjustments in the feeding programs of the predominant length of feed in the quarter under consideration.

6/ The average weight of fed cattle marketed as used in this report is the average weight of Prime, Choice, and Good steers and heifers sold out of first hands at the Chicago, Cincinnati, Denver, Ft. Worth, Indianapolis, Kansas City, Oklahoma City, Omaha, St. Louis, Sioux City, Sioux Falls, South St. Joseph, South St. Paul, West Fargo, and Louisville markets.

Table 3.--Actual and estimated values of fed cattle marketed in 39 States by quarter 1955-66

(1,000 head)

Year	Jan.-Mar. quarter			Apr.-June quarter		
	Predicted by estimator	Actual 1/	Predicted minus actual	Predicted by estimator	Actual 1/	Predicted minus actual
1956	2,938	3,013	-75	2,994	2,952	42
1957	3,155	3,073	82	3,130	3,073	+43
1958	2,872	2,836	36	2,545	2,837	-292
1959	3,175	3,174	1	3,353	3,216	137
1960	3,530	3,501	29	3,608	3,373	235
1961	3,543	3,571	-28	3,758	3,726	32
1962	3,830	3,866	-36	4,007	3,921	86
1963	4,108	4,099	9	4,345	4,348	-3
1964	4,424	4,494	-70	4,522	4,815	-293
1965	4,832	4,822	10	4,800	4,702	98
1966	5,098	5,057	41	5,145	5,230	-85
	July-Sept. quarter			Oct.-Dec. quarter		
1955	2,619	2,700	-81	2,637	2,725	-88
1956	2,723	2,619	104	2,837	2,747	90
1957	2,750	2,784	-34	2,620	2,624	-4
1958	3,217	3,150	67	2,941	2,964	-23
1959	3,440	3,358	82	3,280	3,144	136
1960	3,483	3,454	29	3,308	3,293	15
1961	3,581	3,627	-46	3,552	3,636	-84
1962	3,812	3,844	-32	3,853	3,802	51
1963	4,034	4,141	-107	4,067	4,220	-153
1964	4,431	4,554	-123	4,451	4,456	-5
1965	4,885	4,745	140	4,731	4,667	64

1/Data from May 1967 and October 1965 Livestock - Meat Situation.

Estimators of the average weight of fed cattle marketed are presented in table 4. Over the period considered, 1955-66, the average weight of fed cattle marketed was 1,074 pounds in the first quarter, 1,065 pounds in the second quarter, 1,038 pounds in the third quarter, and 1,058 pounds in the fourth quarter. The average errors when the estimators were used over the historical period were 10, 6, 6, and 6 pounds, respectively, for the four quarters (table 5).

Table 4.--Estimators of the average weight of fed cattle marketed

(pounds)

Quarter		Avg. wt. of fed cattle marketed in previous qtr:		Beef-corn ratio	Constant
Jan.-March...	0.889 x	4th quarter previous yr.	+ 2.925 x	3rd quarter previous yr.	+ 75
Apr.-June....	0.6230 x	1st quarter current yr.	+ 3.0 x	4th quarter previous yr.	+ 332
Jul.-Sept. ..	0.3839 x	2nd quarter current yr.	+ 8.59 x	2nd quarter 1/ current yr.	+ 462
Oct.-Dec. ...	0.6254 x	3rd quarter current yr.	+ 1.695 x	2nd quarter current yr.	+ 376

1/ A 1-quarter lag of the beef-corn ratio proved to be a better explanatory variable in the 3rd quarter than the 2-quarter lag.

METHOD FOR ESTIMATING FUTURE PERIODS

Since the current beef-corn ratio 7/ is used in placements estimators, an estimate can only be made for the current quarter using reported data. Similarly, estimates of marketings and average weights are limited to one quarter in advance, if use of the estimators is limited to reported data.

At the beginning of any quarter, the beef-corn ratio can usually be anticipated with acceptable accuracy. Therefore, an estimate of placements can be made at the beginning of any quarter using the appropriate January 1 inventory variable and the anticipated beef-corn ratio. 7/ Thus, this estimate of nationwide placements is available along with other data when a feedlot operator plans his replacement operations for that quarter.

7/ Choice steer price instead of beef-corn ratio in the second quarter.

Table 5.--Actual and estimated values of average weights of fed cattle by quarter 1955-66 6/

(pounds)

Year	Jan.-Mar. quarter			Apr.-June quarter		
	Predicted by estimator	Actual 1/	Predicted minus actual	Predicted by estimator	Actual 1/	Predicted minus actual
1956	1,041	1,044	-3	1,035	1,044	-9
1957	1,035	1,042	-7	1,032	1,028	4
1958	1,053	1,031	22	1,036	1,035	1
1959	1,100	1,104	-4	1,090	1,078	12
1960	1,094	1,088	6	1,081	1,073	8
1961	1,093	1,094	-1	1,088	1,093	-5
1962	1,092	1,075	17	1,070	1,072	-2
1963	1,078	1,087	-9	1,086	1,096	-10
1964	1,095	1,113	-18	1,084	1,091	-7
1965	1,071	1,063	-8	1,053	1,046	7
1966	1,060	1,071	-11	1,064	1,066	-2
	July-Sept. quarter			Oct.-Dec. quarter		
1955	1,011	1,005	6	1,030	1,032	-2
1956	1,009	1,011	-2	1,031	1,029	2
1957	1,005	1,007	-2	1,035	1,038	-3
1958	1,045	1,036	9	1,060	1,087	-27
1959	1,068	1,064	4	1,079	1,072	7
1960	1,065	1,061	4	1,077	1,075	2
1961	1,065	1,073	-8	1,083	1,074	9
1962	1,028	1,027	1	1,056	1,049	7
1963	1,063	1,074	-11	1,078	1,082	-4
1964	1,031	1,043	-13	1,057	1,058	-1
1965	1,027	1,018	9	1,044	1,042	2

1/ See text footnote 6

Marketings of fed cattle during the second, third, and fourth quarters can be estimated at the beginning of the quarter, while first quarter marketings can be estimated at the beginning of the fourth quarter, given an approximation of the beef-corn ratio. Average weights can always be estimated one quarter in advance using the average weight of the quarter just ended and the appropriate lagged beef-corn ratio. These estimates of national marketings and average weights may be helpful in deciding whether to market a particular lot of cattle a few weeks earlier, or later, than originally planned.

Short-term estimates such as those just outlined are not the only use that can be made of these estimators. Long-run estimates of placements and subsequent marketings can also be made. If assumptions are made about Choice steer and corn prices, placements of cattle on feed can be estimated up to four quarters in advance when the January 1 inventory becomes available in mid-February. Recall that beef (other) calves less than 1 year of age January 1 generate the basic supply of feeder cattle in the second and third quarters, while the January 1 inventory of beef cows, indicative of the calf crop, generates the feeder supply in the fourth quarter and the first quarter of the following year. The user may base his expectations of beef and corn prices on many factors. This example carries no implied recommendation; however, for illustrative purposes, Choice steer prices may be projected from a current level assuming the same seasonal pattern of the previous year, tempered by outlook and additional market information. Corn prices may be based on announced support prices. Future estimates of placements can only be made through the first quarter of the following year. Estimates of marketings follow from placements.

AN EXAMPLE--1-YEAR ESTIMATE

To illustrate use of the estimators in making long-run estimates, let us assume that the time is February 14, 1967. The livestock inventory just released reported 27,262,000 head of beef (other) calves and 34,592,000 head of beef cows on hand January 1, 1967. The January 1, 1966, beef-cow inventory was reported as 34,433,000 head.

If our assumptions about Choice steer and corn prices were correct (identical with reported prices), estimates of placements and marketings through the first half of 1968 as shown in table 6 would have resulted.

Computations to obtain predicted placements for the first quarter of 1967 are given as an example of computations involved for each predicted value.

Table 6.--Simulated and actual placements and marketings of fed cattle in 39 States

(1,000 head)

Year and quarter	Placements			Marketings		
	Predicted 1/	Actual 2/	Predicted minus actual	Predicted 1/	Actual 2/	Predicted minus actual
1967: 1	4,418	4,777	-359	--	5,449	--
2	3,739	3,991	-252	5,211	5,780	-569
3	5,103	5,285	-182	5,248	5,409	-161
4	8,121	8,055	+ 66	5,144	5,282	-138
1968: 1	4,996	5,100	-104	5,511	5,735	-224
2	--	--	--	5,540	3/	--

1/ Simulated with date available February 14, 1967.
2/ See text footnote 4.
3/ Preliminary data not available at time of publication.

	.243	x	Jan. 1 inv. of beef cows the previous yr. (1,000 hd.)	or	34,433	=	8,367
Plus	103.85	x	Beef-corn ratio 1st qtr.	or	17.8	=	1,849
Equals							10,216
Minus the positioner (constant term)							-5,798
Equals predicted value of							4,418

Placements for the first three quarters were underestimated, especially for the current quarter (Jan.-Mar. 1967). Therefore, the slight underestimate of marketings for the third and fourth quarter is understandably low. But marketings in the second quarter of 1967 were substantially underestimated (569,000 head, nearly 10 percent). Apparently marketings in that quarter were stepped up considerably from the placements pattern.

If other market information indicated the likelihood of this underestimate, the cattle feeder should adjust for it. If consideration is given to the sum of the estimates for four quarters beginning with the second quarter 1967 through first quarter 1968, annual placements are underestimated 2.1 percent. Moreover, the estimates of placements for the fourth quarter 1967 and first quarter 1968 appear to be quite accurate even though made 9 months to 1 year in advance. The underestimate of marketings for the same four quarters is somewhat larger, 5 percent, because of the underestimate of placements in the first three quarters of 1967. If actual placement data had been used to predict marketings, the estimate for these four quarters would have been only 0.2 percent. Marketings in the second quarter 1967 would still have been underestimated by 469,000 head, but marketings in the third and fourth quarters 1967 and the first quarter 1968 would have been overestimated 203,000, 148,000, and 78,000 head, respectively.

This example illustrates both the accuracy and potential error that these estimators can yield. Yet, when properly used, they are only one of many methods for predicting the market situation one quarter to a year in advance. As the year progresses, the estimates made in February need to be reconsidered in conjunction with current crop condition reports, weather, and market prices. These estimates of future placements and marketings should be updated at the end of each quarter as actual beef-corn ratios and placement data become available.

APPENDIX

Table 7.--Other data used in development of estimators

Year and quarter	January 1 inventory		Choice steer price 1/	Corn price 2/
	Beef-cows	Beef (other calves)		
1954: 1	25,050	17,978	---	---
1955: 1	25,659	18,804	25.13	1.49
2			23.02	1.47
3			22.33	1.36
4			20.90	1.20
1956: 1	25,371	18,869	19.47	1.27
2			20.30	1.50
3			23.76	1.55
4			22.68	1.33
1957: 1	24,534	18,405	20.84	1.30
2			22.85	1.32
3			24.30	1.30
4			24.27	1.17
1958: 1	24,165	18,275	27.09	1.14
2			28.46	1.32
3			26.39	1.32
4			26.81	1.15
1959: 1	25,112	19,407	27.96	1.19
2			28.83	1.29
3			27.62	1.23
4			26.06	1.10
1960: 1	26,344	20,425	26.53	1.14
2			26.86	1.21
3			25.01	1.18
4			25.28	1.02
1961: 1	27,327	20,814	25.99	1.11
2			23.66	1.11
3			23.64	1.12
4			24.90	1.09
1962: 1	28,691	22,300	25.99	1.09
2			25.91	1.14
3			26.98	1.11
4			28.31	1.10
1963: 1	30,589	23,747	24.85	1.20
2			22.89	1.24
3			24.41	1.23
4			22.83	1.17
1964: 1	32,794	25,243	21.86	1.21
2			20.94	1.20
3			23.73	1.25
4			23.38	1.20
1965: 1	34,238	26,181	23.07	1.28
2			25.54	1.34
3			26.03	1.29
4			25.29	1.17
1966: 1	34,433	26,879	26.81	1.27
2			26.11	1.29
3			25.36	1.44
4			24.43	1.36

1/ Average price of Choice steers at 20 markets.
2/ Average price of No. 3 corn at Chicago.

UNITED STATES DEPARTMENT OF AGRICULTURE
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OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF AGRICULTURE

Table 8.--Technical appendix of regression statistics

Estimator	n	R^2	d	Standard error of estimate	Standard error of coefficient of-- 1st variable	Standard error of coefficient of-- 2nd variable
Placements:						
1st quarter	12	0.970	2.21	165	0.015	15.30
2nd quarter	12	0.970	2.34	137	0.013	3.60
3rd quarter 1/	12	0.975	2.16	159	0.015	28.40
4th quarter	12	0.980	2.25	182	0.015	20.00
Marketings:						
1st quarter	11	0.996	2.04	54	0.001	6.00
2nd quarter	11	0.960	2.33	178	0.019	--
3rd quarter	11	0.985	1.85	94	0.025	--
4th quarter	11	0.986	2.45	90	0.014	--
Average weight:						
1st quarter	11	0.80	2/	13.0	0.247	2.05
2nd quarter	11	0.90	2/	8.5	0.122	1.13
3rd quarter 1/	11	0.81	2/	13.0	0.213	2.22
4th quarter	11	0.91	2/	6.75	0.101	0.88

1/ Beef-corn ratio in 1955 and 1956 increased an average of 3.0 units in lieu of dummy variable. Probably a proxy for drought effects.
2/ Not calculated.

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